

=> d his

(FILE 'HOME' ENTERED AT 12:42:59 ON 15 NOV 2007)

FILE 'CA' ENTERED AT 12:43:08 ON 15 NOV 2007

L1 3317 S GALVANOMET? OR GALVANOMODULAT? OR GALVANOOSCIL? OR GALVANOSCIL?
L2 30563 S (CURRENT OR GALVANO) (2A) (DYNAMIC OR VARY? OR VARIA? OR SCAN? OR
MODULAT? OR OSCIL? OR SWEEP? OR STEP? OR PULSE# OR PULSING)
L3 111 S L1-2 AND RAMAN
L4 549 S L1-2 AND (ROUGH? OR FINELY DIVIDED)
L5 2 S L4 AND (ADATOM? OR ADLAYER?)
L6 116 S L4 AND (CURRENT (2A) DENSITY OR C D)
L7 33 S L4 AND (PORE OR POROUS OR POROSITY)
L8 56 S L4 AND (SILVER OR AG OR GOLD OR AU)
L9 41 S L1-2 AND (SER OR SERS OR SURFACE (1A) ENHANC?)
L10 321 S L3, L5-9
L11 231 S L10 AND PY<2004
L12 4 S L10 NOT L11 AND PATENT/DT AND RAMAN
L13 169 S L11 AND ENGLISH/LA
L14 22 S L11 NOT L13 AND (RAMAN OR UNSTEADY OR PATENT/DT)
L15 195 S L12-14

=> d bib,ab,kwic 115 1-195

L15 ANSWER 16 OF 195 CA COPYRIGHT 2007 ACS on STN
AN 139:388126 CA
TI Subfemtosecond pulse generation by nonadiabatic molecular modulation
AU Wu, Jian; Zeng, Heping
CS Department of Physics, Key Laboratory of Optical and Magnetic Resonance
Spectroscopy, East China Normal University, Shanghai, 200062, Peop. Rep.
China
SO Applied Physics Letters (2003), 83(11), 2127-2129
AB The authors suggest a technique to generate subfemtosecond pulse train
in a **Raman** generator driven by three sufficiently intense single-mode
laser beams whose carrier frequencies are tuned off the **Raman** resonance
with two different two-photon detunings. The **Raman** interaction
establishes a mol. modulation through a nonadiabatic process. The
simulation based on the 1st fundamental vibrational **Raman** transition of
solid H indicates that subfemtosecond pulse train can be generated when
the signs of the two-photon detunings are opposite. This opens an
exptl. feasible way to observe enhanced generation of broadband **Raman**
sidebands as well as compression of the phase-locked **Raman** sidebands
into subfemtosecond pulse trains in the same **Raman** media with above- and
below-resonance **Raman** excitations.

L15 ANSWER 32 OF 195 CA COPYRIGHT 2007 ACS on STN
AN 138:177227 CA
TI Electrochemically Roughened Rhodium Electrode as a Substrate for
Surface-enhanced Raman Spectroscopy
AU Ren, Bin; Lin, Xu-feng; Yan, Jia-wei; Mao, Bing-wei; Tian, Zhong-qun
CS Department of Chemistry State Key Laboratory for Physical Chemistry of
Solid Surfaces, Xiamen University, Xiamen, 361005, Peop. Rep. China
SO Journal of Physical Chemistry B (2003), 107(4), 899-902
AB A method to produce a substrate suitable for **surface-enhanced Raman**

study on the pure massive Rh electrode was developed. The **surface-enhanced Raman** scattering (**SERS**) active Rh electrode with good stability, reversibility, and ease of prepn. can be obtained by the control-current electrochem. roughening method. The **surface enhancement** factor is 3 orders of magnitude. Such kind of enhancement allows the study of not only some mols. of large **Raman** cross-section (e.g., pyridine) but also other mols. of very small **Raman** cross-section (like CO). The Rh surface can be used as a useful substrate for the combined electrochem. and **Raman** study of some systems that are both of fundamental and application interest.

L15 ANSWER 59 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 135:11491 CA

TI Fabrications and characterizations of porous silicon by two-step techniques. II. **Pulse current** application

AU Cheng, Xuan; Liu, Feng-ming; Wen, Zuo-xin; Lin, Chang-jian; Tian, Zhong-qun; Xue, Ru

CS Department of Chemistry, Xiamen University, Xiamen, 361005, Peop. Rep. China

SO Dianhuaxue (2001), 7(1), 78-84

AB Porous silicon structures were formed by two-step technique consisting of **pulse current** applications in 1:1 hydrofluoric acid and ethanol solns. and chem. oxidn. in 20% nitric acid solns. Their surface morphologies and optical properties were characterized by scanning electron microscope (SEM) and **Raman** spectrometer, and compared with those obtained by const. current application. More uniform pore formation on p(100) silicon wafers was obsd. by **pulse current** application. Illumination with an UV lamp during the **pulse current** application accelerated the macropore formation, accordingly, the optical properties were changed.

L15 ANSWER 61 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 134:345846 CA

TI Rhodium as a ubiquitous substrate for **surface enhanced Raman** spectroscopy

AU Ren, Bin; Lin, Xu-feng; Tian, Zhong-qun

CS Department of Chemistry and State Key Lab for Phys. Chem. of Solid Surfaces, Xiamen University, Xiamen, 361005, Peop. Rep. China

SO Dianhuaxue (2001), 7(1), 55-58

AB A method is presented for roughening the surface of Rh to make it applicable for **surface-enhanced Raman** spectroscopy (**SERS**). The deep oxidn. of the Rh surface was carried out by electrochem. etching at a **pulse current** between -30 - 50 mA with a frequency of 200-800 Hz. The applicability for **SERS** was tested for roughened Rh surfaces on which pyridine or CO was adsorbed. The corresponding **SERS** spectra are depicted and discussed and the applicability for **SERS** was proven.

L15 ANSWER 62 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 134:286919 CA

TI Recent trends in electrocatalysis - adsorption of oxygen species on Ag electrodes and the mechanism of H₂O₂ reduction

AU Doblhofer, Karl; Flatgent, Georg; Radhakrishnan, Ganesan; Pettinger, Bruno; Savinova, Elena; Wasle, Sabine

CS Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, D-14195, Germany

SO Transactions of the SAEST (1999), 34(3-4), 88-92

AB In-situ **surface enhanced Raman** spectroscopy (**SERS**) and ex-situ XPS can be employed successfully for detecting oxygen-contg. species on single crystal silver electrodes. From such expts. the mechanism of Ag(111) premonolayer oxidn. in alk. electrolyte is derived. The cathodic redn. of hydrogen peroxide on silver electrodes in acidic electrolyte can proceed by two parallel mechanisms. First, by the normal mechanism that is discussed in the literature, 2nd, by a novel mechanism that operates at a significantly smaller overvoltage. This 2nd mechanism involves as an activating species adsorbed hydroxide, OHads, as known from premonolayer oxidn. of the electrode. Since this adsorbate is unstable in the acidic electrolyte, a nonequil. coverage is generated in cathodic H2O2 redn., where OHads is known to form as an intermediate. Consequently, the 2nd H2O2 redn. mechanism is considered to be of the autocatalytic type. It yields an N-shaped current/voltage curve and **current oscillations**. The conclusions are tested by model calcns.

L15 ANSWER 70 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 133:229600 CA

TI A method and an apparatus for electrochemical **roughening** a support for light-sensitive layers

IN Haby, Georg; Haas, Raimund; Gartmann, Uwe; Hultzs, Gunter; Joerg, Klaus; Kaden, Jorg; Idstein, Hermann

PA Agfa-Gevaert A.-G., Germany

SO Eur. Pat. Appl., 14 pp.

PI	EP 1033420	A1	20000906	EP 2000-104028	20000226
	US 6423206	B1	20020723	US 2000-516805	20000301

PRAI DE 1999-19908884 A 19990302

AB To improve (minimize) the **roughness** of the carrier which is transported through an electrolyte in which the electrochem. **roughening** is carried out, the **pulsed current** or a control of the a.c. or d.c. was used. The **c.d.** between the rotating electrode and the second carrier was changed in a way that it had a lower value in the inner-part of the **roughening** zone. An addnl. rotating electrode was set on the second carrier. The first rotating electrode had a rounded contour which corresponded to the cell design. A detailed description of a design of the system and its scheme are provided.

L15 ANSWER 75 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 132:314954 CA

TI Electrodeposition of **gold** from a sulphite bath by direct and **pulse currents**: applications to opto-electronic devices

AU Roy, S.; Caprodossi, S.

CS Department of Chemical and Process Engineering, University of Newcastle-upon-Tyne, NE1 7RU, UK

SO Proceedings - Electrochemical Society (2000), 99-34 (Electrochemical Technology Applications in Electronics), 145-156

AB The applicability of **gold** electrodeposition from a sulfite electrolyte for the manuf. of opto-electronic devices was studied. Electrodeposition of **gold** was carried out by direct and **pulse currents** at a rotating cylinder Hull type cell and a rectangular flow cell. The

rotating cylinder Hull cell was used to det. the effect of fluid hydrodynamics, **c.d.**, and current waveform on the microstructure of **gold** deposits in the lab. Electrochem. and hydrodynamic parameters that yielded best results in lab. expts. were then used to electrodeposit **gold** on wafers placed in a rectangular flow cell. The microstructure of **gold** was dependent on applied **c.d.** during d.c. deposition, but it was dependent on steady state and nonsteady state mass transfer during **pulse current** plating.

- L15 ANSWER 79 OF 195 CA COPYRIGHT 2007 ACS on STN AN 132:186921 CA
TI Optical properties of multilayered **porous** silicon
AU Setzu, S.; Ferrand, P.; Romestain, R.
CS Universite Joseph Fourier - CNRS (UMR 5588), Laboratoire de Spectrometrie Physique, St Martin d'Heres, 38402, Fr.
SO Materials Science & Engineering, B: Solid-State Materials for Advanced Technology (2000), B69-70, 34-42
AB The authors present a short review of some optical devices based on multilayered **porous** Si, which can be easily obtained by **varying** the formation **current** during the etching process. These include Bragg reflectors and Fabry-Perot microcavities, which can be adjusted from the visible to the near IR. The interface **roughness**, tragic in the case of multilayers, was studied. It can be drastically reduced when changing the electrolyte viscosity. The high reflectivities obtained in this way are measured by Cavity Ring-Down Spectroscopy. Problems occurring when realizing thin layers and an efficient way to adjust precisely the optical thicknesses of the thin layers constituting the multilayered structure are also presented. Finally the authors present a method of calcn. of the emission which takes absorption into account and is able to explain the angular dependence of the luminescence.
- L15 ANSWER 86 OF 195 CA COPYRIGHT 2007 ACS on STN
AN 131:231750 CA
TI A study of surface finishing in **pulse current** electroforming of nickel by utilizing different shaped waveforms
AU Wong, K. P.; Chan, K. C.; Yue, T. M.
CS Hung Hom, Department of Manufacturing Engineering, The Hong Kong Polytechnic University, Kowloon, Peop. Rep. China
SO Surface and Coatings Technology (1999), 115(2-3), 132-139
AB This paper studies exptl. and theor. the effect of different types of shaped waveform on the surface finish of Ni electroforms in **pulse current** electroforming. The quality of the electroforms, in terms of surface **roughness** improvement, influenced by the types of waveform is of the order of ramp and triangular both with relaxation timerectangularramp and triangular sawtooth. At the same cathodic peak **c.d.**, pulse period, and a fixed electrodeposition time or electrodeposition thickness, the surface **roughness** can be reduced by ≤ 2 to 3 times when a relaxation time was used in the cases of ramp and triangular waveforms. These results are supported by the theor. predictions and the study of the surface morphol. of the electroforms by SEM.
- L15 ANSWER 88 OF 195 CA COPYRIGHT 2007 ACS on STN
AN 131:93885 CA

TI A galvanostatic study of the electrodeposition of polypyrrole into porous silicon
 AU Moreno, J. D.; Marcos, M. L.; Agullo-Rueda, F.; Guerrero-Lemus, R.; Martin-Palma, R. J.; Martinez-Duart, J. M.; Gonzalez-Velasco, J.
 CS Departamento de Fisica Aplicada C-12, Universidad Autonoma de Madrid, Madrid, 28049, Spain
 SO Thin Solid Films (1999), 348(1,2), 152-156
 AB Polypyrrole was electrodeposited in the interior of the pores that form the porous silicon structure, and a very significant increase of the elec. cond. of the samples was obsd. Micro-Raman spectroscopy expts. have allowed the authors to measure the amt. of polymer as a function of the distance from the outer porous silicon surface. The degree of filling by the polymer is highly dependent on the electropolymn. conditions, particularly the c.d. applied.

L15 ANSWER 99 OF 195 CA COPYRIGHT 2007 ACS on STN
 AN 129:46640 CA
 TI In situ probing of interfacial processes in the electrodeposition of copper by confocal Raman microspectroscopy
 AU Texier, F.; Servant, L.; Bruneel, J. L.; Argoul, F.
 CS Centre de Recherche Paul Pascal, Pessac, 33600, Fr.
 SO Journal of Electroanalytical Chemistry (1998), 446(1-2), 189-203
 AB Confocal Raman microspectroscopy is applied to the in situ probing of interfacial processes in pulsed-current copper electrodeposition. This technique provides time-resolved characterization of the vibrational spectra of sulfate ions whenever in soln. or adsorbed on the growing electrode. It also confirms the formation of cuprous oxide in the redn. process as the soln. pH is increased by proton redn. Moreover, when the passage of current is terminated, this technique provides evidence for the recombination of copper ions with copper metal to produce cuprous oxide on the outermost branches of the deposit.

L15 ANSWER 103 OF 195 CA COPYRIGHT 2007 ACS on STN
 AN 128:42084 CA
 TI Local modulation of the quantum-well quasicontinuum states using charged-carrier transfer induced by intersubband transitions
 AU Bendayan, M.; Kapon, R.; Beserman, R.; Sa'ar, A.; Planel, R.
 CS Technion, Solid State Institute and Physics Department, Israel Institute of Technology, Haifa, 32000, Israel
 SO Physical Review B: Condensed Matter (1997), 56(15), 9239-9242
 AB By generating a local elec. field across an asym. coupled quantum-well structure and using resonant Raman spectroscopy as a probe, the authors were able to resolve two classes of continuum electronic states of energies close to the barrier height. The 1st class is related to a continuum resonant state that is located near the edge of the barrier and is extended across the barrier region but not across the coupled quantum wells. The 2nd class of continuum states is related to a quasibound resonant state that is localized above the quantum wells. Therefore, a local elec. field across the coupled quantum wells modifies the energy spectrum of the localized resonant state while keeping the delocalized resonance unaffected. In the authors' expt. the local elec. field was generated by intersubband photoexcitation of carriers from one quantum well to the other. The authors obsd. a red shift of the

quasibound resonant state due to the intersubband photoexcitation.

L15 ANSWER 108 OF 195 CA COPYRIGHT 2007 ACS on STN
AN 127:182647 CA
TI Assessment of conditions influencing **porous** Si electroluminescence
AU Sen, S.; Siejka, J.; Savtchouk, A.; Lagowaki, J.
CS Center for Microelectronics Research, University of South Florida,
Tampa, FL, 33620, USA
SO Journal of the Electrochemical Society (1997), 144(6), 2230-2233
AB Visible electroluminescence (EL) characteristics of **porous** Si formed on
p, n, p+-n, and n+-p junction substrates were studied under **pulse**
current regime. We provide exptl. proof that **porous** Si structures
characterized by highest EL intensity have simultaneously highest
photoluminescence (PL) intensity and lowest surface **roughness**. PL and
EL can be correlated via surface **roughness**. Two types of EL
instabilities are obsd.: fast, with time const. in the milliseconds
range and slow, with time const. in the hours range. The fast EL
instability is affected by the type of ambient and/or sample temp.
during elec. excitation and probably is assocd. with the charging of the
porous network.

L15 ANSWER 109 OF 195 CA COPYRIGHT 2007 ACS on STN
AN 127:114515 CA
TI **Rough** electrical contact surface
IN Lykins, James L., III
PA Micromodule Systems, USA
SO PCT Int. Appl., 27 pp.
PI WO 9725455 A1 19970717 WO 1997-US86 19970110
US 5876580 A 19990302 US 1996-586232 19960112
US 6245445 B1 20010612 US 1999-260273 19990302

PRAI US 1996-586232 A 19960112
AB A method for rendering a surface of a contact **rough** includes submerging
the surface of the contact in an electroplating bath having a dissolved
metal salt, and **pulsing** an elec. **current** through the contact and the
bath to form a **rough** metallic structure on the surface of the contact.

L15 ANSWER 115 OF 195 CA COPYRIGHT 2007 ACS on STN
AN 126:39298 CA
TI The design and implementation of a high-fidelity **Raman** imaging
microscope
AU Goldstein, S. R.; Kidder, L. H.; Herne, T. M.; Levin, I. W.; Lewis, E.
N.
CS Biomedical Engineering and Instrumentation Program, National Institutes
Health, Bethesda, MD, 20892, USA
SO Journal of Microscopy (Oxford) (1996), 184(1), 35-45
AB The authors describe a **Raman** imaging microscope that produces high-
fidelity, large format **Raman** images and **Raman** spectra from samples ≥ 1
 μm in size. Laser illumination is delivered to the object by an
infinity cor. microscope objective, either by a **galvanometer** scanning
system or a widefield fiber optic. Wavelength selection of **Raman**
scattered emission is achieved by an acousto-optic tunable filter
(AOTF), which maintains image fidelity and provides either continuous or

random wavelength selection. The collimated AOTF output is imaged 1st by a tube lens and then by a projection lens onto a cooled Si CCD array. Instrument features, including factors that det. the system's spatial and spectral resoln., and design considerations are discussed. Images and spectra of test objects and samples that demonstrate the capability of this imaging spectrometer are presented. The potential of intrinsic chem. imaging is discussed in terms of its use in the analyses of a variety of chem. and biol. samples.

L15 ANSWER 118 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 125:70484 CA

TI **Raman** imaging microscopy: A novel chemical imaging technique

AU Kidder, Linda H.; Goldstein, Seth R.; Levin, Ira W.; Lewis, E. Neil

CS National Institutes Health, Bethesda, MD, 20892, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (1996), 2655(Three-Dimensional Microscopy: Image Acquisition and Processing III), 140-147

AB The authors describe a **Raman** imaging microscope that produces high-fidelity, large format **Raman** images and **Raman** spectra at close to diffraction-limited spatial resoln. A Si charge-coupled device (CCD) was used as a high sensitivity array detector. Wavelength selection of **Raman** scattered emission is achieved by an acousto-optic tunable filter (AOTF), which maintains image fidelity and provides either continuous or random wavelength selection. Laser illumination is delivered to the object by an infinity cor. microscope objective, either by a **galvanometer** scanning system or a widefield fiber optic. The laser scanning mechanism has higher power densities and provides **Raman** microprobe capabilities when stopped at a prescribed point. The fiber optic illumination scheme, however, is useful for delicate samples which might be damaged by the higher power densities generated by the point scanner mechanism and for sample alignment and system focusing. Instrument features, including factors that det. the system's spatial and spectral resoln., are discussed. Images and spectra of test objects and samples that demonstrate the capabilities of this imaging spectrometer are presented. The potential of intrinsic chem. imaging is discussed in terms of its use in the analyses of a variety of chem. and biol. samples.

L15 ANSWER 124 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 123:73531 CA

TI A new confocal stigmatic spectrometer for micro-**Raman** and microfluorescence spectral imaging analysis: Design and applications

AU Feofanov, A.; Sharonov, S.; Valisa, P.; Da Silva, E.; Nabiev, I.; Manfait, M.

CS Lab. de Spectroscopie Biomoléculaire, Univ. de Reims Champagne-Ardenne, Reims, 51096, Fr.

SO Review of Scientific Instruments (1995), 66(5), 3146-58

AB A new instrument was developed permitting confocal spectral imaging technique to be carried out with a lateral resoln. $\sim 0.3 \mu\text{m}$ and an axial resoln. $\sim 1.0 \mu\text{m}$ for specimen areas ranging from 5×5 to $150 \times 150 \mu\text{m}$. The modular **Raman**/fluorescence spectrometer was equipped with a CCD camera, microscope, motorized sample stage, and the confocal entrance

chamber. A system of **galvanometer** controlled mirror scanners equipped the confocal entrance chamber, allowing spectra to be accumulated up to several hundreds of points of sample in parallel, with adjustable spectral and spatial resoln. Stray light rejection property of the **Raman** spectrometer provides the possibility of the **Raman** spectral image to be recorded in the low frequency domain. A software was developed to control image accumulation, creation, and treatment. The methods of spectral anal. being applied to a multidimensional set of spectra permit the multiform spectral images to be created. To create these images, the different spectral parameters and their combination can be used, namely: intensity of characteristic bands and their ratios, width of spectral bands, and shift of band frequencies. The decompn. algorithms can be applied to two dimensional (or three-dimensional) images to deconvolute the overlapped spectra of sample components or to analyze the subtle spectral differences. The three-dimensional performance of the instrument was analyzed in the particular examples of microfluorescence study of matrixes for piezoelec. elements prodn., micro-**Raman** study of fluid inclusions in mineral, micro-**Raman** mapping of polymeric materials, and microfluorescence anal. of drug interactions with living cancer cells. The spectrometer is suitable for a wide range of applications in mineralogy, material research, solid state physics, biophysics, cellular biol., and medicine.

L15 ANSWER 127 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 120:333613 CA

TI The effect of process parameters on the anodic dissolution of copper into NaCl/KSCN electrolytes

AU Gu, Z. H.; Chen, J.; Fahidy, T. Z.; Olivier, A.

CS Dep. Chem. Eng., Univ. Waterloo, Waterloo, ON, N2L 3G1, Can.

SO Journal of Electroanalytical Chemistry (1994), 367(1-2), 7-14

AB The effect of pH, KSCN concn., NaCl concn. and imposed anode potential on oscillation patterns obsd. in the anodic dissoln. of copper into aq. solns. has been investigated. **Surface-enhanced Raman** spectroscopy of the anode surface indicates the complexity of interaction between these process parameters and the surface morphol.

L15 ANSWER 130 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 118:243248 CA

TI Resonance **Raman** measurement of electrochemically generated short-lived intermediates by means of a pulse electrolysis stopped flow method

AU Oyama, Munetaka; Okada, Mikio; Okazaki, Satoshi

CS Dep. Chem., Coll. Gen. Educ. and Grad. Sch. Hum. Inf., Nagoya Univ., Chikusa-ku, Nagoya, 464-01, Japan

SO Journal of Electroanalytical Chemistry (1993), 346(1-2), 281-90

AB Resonance **Raman** (RR) measurement with a pulse electrolysis stopped flow method was developed for the purpose of the measurement of electrochem. generated short-lived intermediates. In this method the soln., electrolyzed by imposing a **current pulse** on a column electrode, is delivered to an optical flow cell by a stopped flow technique and then the RR spectrum is obsd. at the optical cell. The RR spectrum of the triphenylamine cation radical (TPA^{•+}), which dimerizes rapidly to produce the dimeric compd. tetraphenylbenzidine (TPB), was successfully measured selectively without any interference by the oxidn. products of

TPB generated in subsequent electron transfer reactions. The RR spectrum of TPA^{•+} obtained had a different profile from that of the dimer cation radical (TPB^{•+}) but was quite similar to that of the dimer dication (TPB²⁺). This result shows the similarity between the vibrational structures of TPA^{•+} and TPB²⁺, which can be explained by their canonical structures. By using the proposed method, it should become possible to observe the RR spectra of electrogenerated intermediates whose half-lives are several tens of milliseconds.

L15 ANSWER 146 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 112:165811 CA

TI Differential reflectance spectroscopy and **SERS** of mildly **roughened silver** electrodes

AU Bryant, Mark A.; Pemberton, Jeanne E.

CS Dep. Chem., Univ. Arizona, Tucson, AZ, 85721, USA

SO Langmuir (1990), 6(4), 751-8

AB Differential reflectance spectroscopy was used to measure the reflectivity of electrochem. **roughened Ag** electrodes in 0.1 M KCl and 0.1 M KCl/0.05 M pyridine. The electrodes were subjected to **varying** anodic **current densities** in double-potential-step oxidn.-redn. cycles.

A correlation exists in both systems between **SERS** intensities for both **v** (**Ag-Cl**) and pyridine ring breathing vibrations and the magnitude of the decrease in reflectivity. Surfaces that exhibit the greatest decrease in reflectivity exhibit the greatest **SERS** intensity. SEM was used to characterize surface morphol. The reflectivity spectra are interpreted in terms of absorption by large-scale **Ag roughness** features. The correlation between decrease in reflectivity and increased **SERS** intensity is proposed to be due to electromagnetic enhancement effects.

L15 ANSWER 160 OF 195 CA COPYRIGHT 2007 ACS on STN

AN 101:119306 CA

TI Diffusion-controlled multisweep cyclic voltammetry. III. Deposition of **silver** on stationary and rotating-disk electrodes

AU Andricacos, P. C.; Ross, P. N., Jr.

CS Lawrence Berkeley Lab., Univ. California, Berkeley, CA, 94720, USA

SO Journal of the Electrochemical Society (1984), 131(7), 1531-8

AB An exptl. study of diffusion-controlled **Ag** electrodeposition was carried out in order to investigate the applicability of the model for reversible metal deposition during multisweep cyclic voltammetry. For a stationary planar electrode, excellent agreement between theory and expt. was obtained for the position of the cathodic current max. on the potential axis, as well as for the dependence of their magnitude on parameters such as sweep rate, cathodic reversal potential, and no. of applied sweeps. Anodic currents measured at the foot of the wave deviated from theor. predictions as a consequence of the small but uncompensated resistance of the electrolyte. In an effort to predict and therefore control the amt. of deposit, integral charges assocd. with each sweep were measured and successfully correlated with the parameters of the expt. At millimolar concns., deposit thicknesses of the order of up to 20 monolayers can be formed with quant. control. Expts. with a rotating-disk electrode have demonstrated that a periodic current response is obtained upon multiple sweeping, as predicted by theory.

First **sweep** and periodic **currents** normalized with respect to the limiting current could be correlated with the dimensionless sweep rate in accordance with the theor. predictions. Contrary to previous investigations, the diffusion coeff. of the **Ag** ion was detd. by limiting current measurements, and the value thus obtained was subsequently used to successfully correlate stationary electrode cyclic voltammetry data. During limiting current measurements with very slow sweeps, the development of surface **roughness** was obsd. as a significant increase of the current from the const. value obtained at faster sweeps. Based on the dimensionless sweep rate, a semiempirical criterion was developed for the optimal conditions for the potentiodynamic detn. of steady-state limiting currents, the use of which may eliminate errors arising from both transient effects and surface area increase due to **roughness**.

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(FILE 'HOME' ENTERED AT 08:47:24 ON 15 NOV 2007)

FILE 'CA' ENTERED AT 08:47:33 ON 15 NOV 2007

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L1 134 S GALVANODYNAMIC
L2 7806 S POTENTIODYNAMIC
L3 27 S L2 AND L1
L4 0 S L1 AND (MODULAT? OR ELECTROMODULAT?)
L5 5 S L1 AND (POROSIT? OR PORE OR POROUS)
L6 72 S L1 AND (POLARIZATION CURVE OR ELECTROREDUCTION OR
    GALVANODYNAMIC/TI,ST,IT)
L7 51 S L1-2 AND ADATOM?
L8 140 S L3-7
L9 134 S L8 AND PY<2004
L10 6 S L8 NOT L9
L11 1 S L2/IT AND L10
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=> d bib,ab,kwic 19 1-134

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L9 ANSWER 5 OF 134 CA COPYRIGHT 2007 ACS on STN
AN 136:392351 CA
TI Electrokinetic behavior of gold alloy and composite plating baths
AU Bozzini, B.; Cavallotti, P. L.; Giovannelli, G.
CS INFM, Dipartimento di Ingegneria dell'Innovazione, Universita di Lecce,
Lecce, Italy
SO Metal Finishing (2002), 100(4), 50,52-54,56-60
AB The electrochem. processes involved in Au-Cu and Au-Cu-Cd alloy and
composite deposition were studied. Two kinds of Au-Cu electrodeposition
baths were investigated: an alk. cyanide bath and an acidic EDTA bath.
For comparison an alk. cyanide Au-Cu-Cd bath was also used. The ceramic
material was B4C with particles of an av. diam. of 2.52 µm and median
diam. of 0.6 µm. Microstructures were studied with SEM and XRD and
electrochem. investigations on baths not contg. particles were performed
by potentiodynamic and galvanodynamic measurements. Galvanostatic and
potentiodynamic measurements were made on baths with and without
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dispersion of ceramic particles. The high free-cyanide cyanoalkaline baths displayed a sigmoidal **potentiodynamic** behavior and a hysteretic **galvanodynamic** behavior. Metallog. cross sections of deposits obtained from such baths showed a laminar structure with an alternation of Au-enriched and Au-depleted regions under cell potential control. Under current control the deposits had a homogeneous contribution in both branches of the hysteresis loop. Embedding of nonconductive particles in all the investigated baths for alloy deposition correlated with an increase of the content of the less noble alloying element. In nonhysteretic alloy deposition baths (EDTA Au-Co and cyanide Au-Cu-Cd) such a phenomenon was the only obsd. consequence of dispersing particles while in hysteretic baths (cyanoalkaline Au-Cu) in addn. to this phenomenon compositional heterogeneities were present. The phenomenon of "tails" and "crests" formation in hysteretic baths loaded with insulating particles took the place of the layering which could be obsd. by operating baths not contg. particles under cell potential control. Both phenomena could be explained with the same kind of instability.

L9 ANSWER 8 OF 134 CA COPYRIGHT 2007 ACS on STN
 AN 135:324247 CA
 TI Potential Oscillations and S-Shaped **Polarization Curve** in the Continuous Electro-oxidation of CO on Platinum Single-crystal Electrodes
 AU Koper, Marc T. M.; Schmidt, Thomas J.; Markovic, Nenad M.; Ross, Philip N.
 CS Schuit Institute of Catalysis Laboratory of Inorganic Chemistry and Catalysis, Eindhoven University of Technology, Eindhoven, 5600, Neth.
 SO Journal of Physical Chemistry B (2001), 105(35), 8381-8386
 AB The occurrence of an S-shaped **polarization curve** in a simple model for the continuous electrochem. oxidn. of CO on a platinum electrode is discussed. In the model, the S-shaped **polarization curve** is caused by the competitive Langmuir-Hinshelwood mechanism between surface-bonded CO and OH. The reaction is studied exptl. on single-crystal platinum rotating disk electrodes in perchloric and sulfuric acid soln., and it is shown that the voltammetry is in good agreement with the model predictions. When studied under current-controlled conditions, a fast **galvanodynamic** scan indeed suggests the existence of the S-shaped **polarization curve**. At lower scan rates, however, irregularities and small-amplitude irregular fluctuations or oscillations in potential are obsd. Very regular potential oscillations under current-controlled conditions are obsd. only on Pt(111) in sulfuric acid. The possible origin of these irregularities and oscillations is discussed in relation to the existing theories of electrochem. instabilities.

L9 ANSWER 14 OF 134 CA COPYRIGHT 2007 ACS on STN
 AN 129:251658 CA
 TI Electrodeposition of hard magnetic alloys from non-aqueous electrolytes
 AU Holstein, N.; Juttner, K.
 CS Karl-Winnacker-Institut der DECHEMA e. V., Frankfurt am Main, D-60486, Germany
 SO Proceedings - Electrochemical Society (1998), 97-27(Fundamental Aspects of Electrochemical Deposition and Dissolution Including Modeling), 240-252
 AB The electrochem. deposition of Sm-Co layers on platinum and copper

substrates was studied using the aprotic electrolytes formamide + SmCl_3 + CoCl_2 + KCl and propylene carbonate + $\text{Sm}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$ + $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ + Bu_4NPF_6 by **potentiodynamic** and **galvanodynamic** measurements dependent on different system parameters. The properties of the layers were detd. by SEM, EDX, XRD and magnetic measurements. The Sm/Co ratio of the galvanic deposits depends not only on the compn. of the electrolyte, but also on the deposition conditions, e.g. potentiostatic or galvanostatic polarization, convection, supporting electrolyte, etc. So far layers with the best properties were obtained under galvanostatic conditions from a propylene carbonate soln. with a mole ration Sm:Co = 3:1. These layers have metallic characteristics and show a distinct hysteresis in the magnetization loop.

L9 ANSWER 19 OF 134 CA COPYRIGHT 2007 ACS on STN
AN 126:49747 CA
TI Electrochemical AC etching of aluminum foils in hydrochloric acid electrolytes
AU Jeong, Jae Han; Kim, Sung Su; Kim, Hyun Gi; Choi, Chang Hee; Lee, Dong Nyung
CS Samsung Research Institute, Sam Young Electronics Co., Ltd., Seong Nam, 462-120, S. Korea
SO Materials Science Forum (1996), 217-222(Pt. 3, Aluminium Alloys, Pt. 3), 1565-1570
AB The electrochem. a.c. etching behavior of an Al foil was studied in 1.5 M HCl soln. at different temps. (35-60°), and varying current frequencies 1-60 Hz. The **galvanodynamic polarization curves** were recorded and the microstructures were investigated by SEM. At a frequency of 10 Hz optimal etching occurred (**porous** and homogeneous etched layers were formed). Below that frequency macro-thinning took place and above that frequency irregular local corrosion was obsd. The etch pit size decreased with increasing frequency.

L9 ANSWER 60 OF 134 CA COPYRIGHT 2007 ACS on STN
AN 104:35524 CA
TI **Potentiodynamic** electrodeposition of paint (EDP)
AU Beck, Fritz; Guder, Harald
CS FB6-Elektrochem., Univ. GH-Duisburg, Duisburg, D-4100/1, Fed. Rep. Ger.
SO Journal of Applied Electrochemistry (1985), 15(6), 825-36
AB **Potentiodynamic** electropainting at a rotating iron disc electrode was investigated with 3 different EDP resins, 2 anodic of the acrylate type and 1 cathodic of the epoxide type, and a wide variation of conditions. Voltage scan rate ($v_s = 1$ to 200 Vs^{-1}), voltage range (40 to 200 V) and electrode rotation speed ($n = 60$ and 1000 rpm) were the most important parameters. The (cyclic) voltammetric curves obtained generally exhibit 3 characteristic features: (1) the current rises steeply at the start of the expt. Bath resistance transforms the **potentiodynamic** curve simultaneously into a **galvanodynamic** curve. After a transition time, t , a crit. pH is attained at the phase boundary and electrocoagulation occurs. This leads to a rapidly decreasing c.d. The sharp c.d. max. thus established has a peak voltage, U_p , which increases with v_s according to the relation $\log U_p \sim 1/3 \log v_s$ in accordance with theory. (2) At high voltages, a limiting c.d. is obsd., increasing with

the square root of vs. This could be quant. interpreted in terms of dynamic growth of film thickness governed by Ohmic ion transport in the film. The preceding part of the U/j curve declines with $j \sim t^{-1/2}$, which indicates the prevalence of space charge effects. (3) Ohmic lines are measured in the course of the first reverse scan and in all quasi steady state follow up cycles. They are flatter by a factor of 1000 in regard to the initial Ohmic line and reflect low voltage Ohmic behavior of the EDP-film. At high voltages pos. current deviations occur due to Child's law. The curves can be measured easily and reproducibly. Due to their salient features it is proposed to use them for characterization of EDP-paints.

L9 ANSWER 128 OF 134 CA COPYRIGHT 2007 ACS on STN

AN 80:22086 CA

OREF 80:3601a,3604a

TI Formation of finely divided precipitates during reduction of metals on mercury or amalgamated electrodes

AU Geinrikhs, K. Ya.; Gladyshev, V. P.; Babkin, G. N.

CS USSR

SO Trudy Instituta Khimicheskikh Nauk, Akademiya Nauk Kazakhskoi SSR (1973), 35, 33-48

LA Russian

AB The conditions of formation of finely divided deposits on Hg and amalgam electrodes was dependent on the metal nature, compn. of the electrolyte, and parameters of electrolysis. Tests were conducted for Cd, Pb, Bi, and Ta and for Cu, Zn, In, Sn, Fe, and Co by the method of plotting potentiostatic and **galvanodynamic polarization curves**. The forming finely divided deposits on Hg surface did not depend on the metal soly. in Hg; their formation started at a specific electrode potential for each metal, irrespective on the concn. of the metal in the electrolyte and amalgam. The conditions of formation of finely divided deposits of metals were similar for solid and liq. electrodes; this was indicative of a single formation mechanism of these deposits on solid and liq. electrodes. The mechanism of formation of these deposits during the **electroredn.** of metals was independent of the material and aggregate state of the electrode as well as on the compn. of the soln.

L9 ANSWER 134 OF 134 CA COPYRIGHT 2007 ACS on STN

AN 72:62189 CA

OREF 72:11360h,11361a

TI Automatic polarization apparatus for electrochemical corrosion studies

AU Henry, W. D.; Wilde, Bryan Edmund

CS Appl. Res. Lab., U. S. Steel Corp., Monroeville, PA, USA

SO Corrosion (Houston, TX, United States) (1969), 25(12), 515-19

AB Statistical alloy development programs using electrochem. screening techniques, require facilities for precision polarization data; presently available equipment and methods are not entirely satisfactory. Modifications were made to readily available com. equipment to improve the sensitivity and reproducibility significantly. A detailed description is given of the production of an app. that automatically measures and records anodic and cathodic **polarization curves** over an applied potential range of ± 2.0 V. Traverse rates between 2×10^{-3} and

3 × 10⁴ V/hr are attainable and can be used to polarize electrodes through 0 V (with respect to the reference electrode) without manual switching. A special switch is described for using the basic electronic potentiostat as a const. current or const. voltage source by manual selection. The results obtained from 3 typical polarization expts.: (1) **potentiodynamic** anodic polarization, (2) **galvanodynamic** cathodic polarization, and (3) **galvanodynamic** linear polarization of AISI type 304 stainless steel in H-satd. N H₂SO₄ at 25° showed the performance of the app. to be equal to or superior to that of conventional manual procedures. Errors from curve plotting are eliminated.

=> log y

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